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Applicants : Hans Thomann et al.  
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For : METHOD FOR BOREHOLE MEASUREMENT OF  
FORMATION PROPERTIES

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Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

**REQUEST FOR INTERFERENCE WITH PATENT  
PURSUANT TO 37 C.F.R. § 1.607**

Sir:

Applicants have filed, concurrently herewith, the above-referenced continuation application and a Preliminary Amendment thereto. The Preliminary Amendment cancels original claims 1-22 and adds to the continuation application new claims 23-26 (copied from Onyia United States Patent No. 6,473,696 B1 ("Onyia")). The purpose of this Paper is to request interference between claims 23-26 of the above-referenced application and all of the claims (claims 1-51) of the Onyia patent.

This Paper will be followed by an Information Disclosure Statement under 37 C.F.R. § 1.97.

**A. Introduction**

The invention that is common to Applicants' claims 23-26 and Onyia claims 1-51 is a method for determining properties of subsurface earth formations. The method is useful, for example, in oil exploration to determine pore pressure in subsurface formations. "Pore pressure" refers to the pressure of the fluid present in the pores of a subsurface formation, which can be indicative of the presence of oil within the formation.

The method calls for obtaining seismic data for a subsurface region of the earth. Seismic data are obtained by monitoring shockwaves that travel through the subsurface created, for example, by the operation of a drill bit, by detonating explosives, by striking the ground with a thumper, by employing an acoustic signal generator, or the like. Shockwaves are often referred to as "seismic" when they are of relatively low frequency – for example, 100 Hz or less. Seismic waves propagate through the subsurface, and their velocities depend in part on the characteristics of the subsurface formations through which they travel. Seismic waves are often reflected by the boundaries between different subsurface formations.

The method requires estimating seismic velocities for at least one interval of the subsurface region. The seismic velocities are calibrated to a parameter or property of interest in the subsurface interval, which allows determination of the parameter, e.g., level of pore pressure or type of rock (lithology) present in the interval.

Applicants' claims 23-26 are copied from Onyia claim 9. Onyia claim 9 is a dependent claim that depends from Onyia independent claim 1 and sets forth a Markush

group containing 13 ways to obtain seismic velocities.<sup>1</sup> Applicants' claim 23 is identical to Onyia claim 9, except that the Markush group in Applicants' claim 23 includes three of the 13 ways to obtain seismic velocities that are set forth in Onyia claim 9. Applicants' claims 24-26 depend from claim 23, and each include one of the three ways to obtain seismic velocities that are set forth in Applicants' claim 23. Thus, all of the subject matter of Applicants' claims 23-26 is embraced by Onyia claim 9.

The following chart shows that the limitations of Applicants' claim 23 are set forth identically in Onyia claim 9:

<b>Applicants' Claim 23</b>	<b>Onyia Claim 9 (Dependent From Claim 1)</b>
23. A method for determining a parameter of interest of a subsurface region of earth formations comprising: (a) obtaining seismic survey information about the subsurface region; (b) identifying a plurality of interpreted seismic horizons of interest from the obtained survey information;	1. A method for determining a parameter of interest of a subsurface region of earth formations comprising: (a) obtaining seismic survey information about the subsurface region; (b) identifying a plurality of interpreted seismic horizons of interest from the obtained survey information;
(c) obtaining estimated seismic velocities corresponding to at least one interval between at least one pair of said plurality of seismic horizons,	(c) obtaining estimated seismic velocities corresponding to at least one interval between at least one pair of said plurality of seismic horizons;
<i>[Limitations (d) and (e) of Onyia claim 9 are identical to limitations (d) and (e) below.]</i>	(d) calibrating the estimated seismic velocities to the parameter of interest (e) using the results of said calibration and the obtained seismic velocities to obtain the parameter of interest at any location within the seismic survey.
wherein the obtained seismic	9. The method of claim 1 wherein

<sup>1</sup> The ways of obtaining seismic velocities in Onyia claim 9 are numbered (i) through (xi), plus (xiii) and (xiv). There is no (xii). Thus, there are 13 listed ways to obtain seismic velocities.

<b>Applicants' Claim 23</b>	<b>Onyia Claim 9 (Dependent From Claim 1)</b>
<p>velocities are selected from the group consisting of:</p> <p>(i) S-wave velocity data generated from normal moveout (NMO) velocity analysis,</p> <p>(ii) P-wave velocity data from VSP look-ahead inversion, and</p> <p>(iii) S-wave velocity data from VSP look-ahead inversion;</p>	<p>the obtained seismic velocities are selected from the group consisting of:</p> <p>(i) P-wave velocity data generated from normal moveout (NMO) velocity analysis</p> <p>(ii) P-wave or S-wave velocity data generated from coherency inversion analysis</p> <p>(iii) P-wave velocity generated from pre-stack inversion</p> <p>(iv) P-wave velocity generated from post-stack inversion</p> <p>(v) S-wave velocity generated from pre-stack inversion</p> <p>(vi) S-wave velocity generated from post-stack inversion</p> <p>(vii) S-wave velocity data generated from normal moveout (NMO) velocity analysis</p> <p>(viii) P-wave velocity generated from tomography</p> <p>(ix) S-wave velocity generated from tomography</p> <p>(x) P-wave velocity data from vertical seismic profiling (VSP)</p> <p>(xi) P-wave velocity data from VSP look-ahead inversion</p> <p>(xiii) S-wave velocity data from vertical seismic profiling (VSP)</p> <p>(xiv) S-wave velocity data from VSP look-ahead inversion.</p>
<p>(d) calibrating the estimated seismic velocities to the parameter of interest; and</p> <p>(e) using the results of said calibration and the obtained seismic velocities to obtain the parameter of interest at any location within the seismic survey.</p>	<p><i>[Limitations (d) and (e) of Applicants' claim 23 are identical to limitations (d) and (e) above.]</i></p>

As explained in detail below, Onyia claim 9 is representative of the claims of the Onyia patent, all of which are directed to a single invention. Accordingly,

Applicants seek an interference having one proposed Count that is identical to Onyia claim 9. Applicants' claims 23-26 and Onyia's claims 1-51 should be designated as corresponding to the proposed Count.

Applicants should be the senior party in the requested interference. The present patent application is a continuation of and claims priority to Applicants' pending U.S. patent application Serial No. 09/973,529 ("the '529 application"), filed October 9, 2001. The '529 application is a continuation-in-part of and claims priority to abandoned U.S. patent application Serial No. 09/686,735 ("the '735 application"), filed October 10, 2000. The '735 application fully disclosed the subject matter of Applicants' claims 23-26.

The Onyia patent issued October 29, 2002, on an application filed March 13, 2001. A Certificate of Correction for the Onyia patent shows that no claim of priority is made to an earlier application. Therefore, by virtue of Applicants' earlier effective filing date, Applicants should be the senior party in the requested interference.

**B. Identification Of Patent**  
**(37 C.F.R. § 1.607(a)(1))**

Applicants request that an interference be declared with Onyia U.S. Patent 6,473,696 B1, which issued October 29, 2002, on an application filed March 13, 2001.

**C. Presentation Of A Proposed Count**  
**(37 C.F.R. § 1.607(a)(2))**

Applicants request that an interference be declared with the following proposed Count 1. Proposed Count 1 is identical to Onyia claim 9, written in independent form. (A typographical error in the numbering of sublimitations of Onyia claim 9 has been corrected in proposed Count 1.)

### Proposed Count 1

A method for determining a parameter of interest of a subsurface region of earth formations comprising:

- (a) obtaining seismic survey information about the subsurface region;
- (b) identifying a plurality of interpreted seismic horizons of interest from the obtained survey information;
- (c) obtaining estimated seismic velocities corresponding to at least one interval between at least one pair of said plurality of seismic horizons, wherein the obtained seismic velocities are selected from the group consisting of:
  - (i) P-wave velocity data generated from normal moveout (NMO) velocity analysis,
  - (ii) P-wave or S-wave velocity data generated from coherency inversion analysis,
  - (iii) P-wave velocity generated from pre-stack inversion,
  - (iv) P-wave velocity generated from post-stack inversion,
  - (v) S-wave velocity generated from pre-stack inversion,
  - (vi) S-wave velocity generated from post-stack inversion,
  - (vii) S-wave velocity data generated from normal moveout (NMO) velocity analysis,
  - (viii) P-wave velocity generated from tomography,

- (ix) S-wave velocity generated from tomography,
  - (x) P-wave velocity data from vertical seismic profiling (VSP),
  - (xi) P-wave velocity data from VSP look-ahead inversion,
  - (xii) S-wave velocity data from vertical seismic profiling (VSP), and
  - (xiii) S-wave velocity data from VSP look-ahead inversion;
- (d) calibrating the estimated seismic velocities to the parameter of interest; and
  - (e) using the results of said calibration and the obtained seismic velocities to obtain the parameter of interest at any location within the seismic survey.

**D. Identification Of Claims In The Onyia Patent Corresponding To The Proposed Count (37 C.F.R. § 1.607(a)(3))**

All claims of the Onyia patent -- claims 1-51 -- correspond to proposed Count 1. Onyia claim 9 corresponds exactly to proposed Count 1. Onyia claims 1-8 and 10-51 correspond substantially to proposed Count 1.

A review of Onyia's claims confirms that all of Onyia's claims are directed to a single invention, and that Onyia claim 9 is representative of the Onyia claims. Onyia claim 9 falls within the scope of the two primary independent claims of the Onyia patent, Onyia claims 1 and 25. The Onyia patent has four other independent claims (claims 48-51), but these are merely narrowed versions of Onyia claims 1 and 25,

each specifying a particular parameter of interest. Most of Onyia's dependent claims expand upon the basic steps of Onyia claims 1 and 25 by specifying ways of carrying out those steps. The remainder of Onyia's dependent claims set forth additional steps to define with more particularity the basic method of Onyia claims 1 and 25. These additional steps do not change the underlying method of Onyia claims 1 and 25.

In summary, all of Onyia's claims 1-51 are directed to a single invention. The differences between Onyia claim 9 (which is identical to proposed Count 1) and the other Onyia claims do not change the underlying invention to which the Onyia claims are directed.

**E. Identification Of The Applicants' Claims  
Corresponding To The Proposed Count  
(37 C.F.R. § 1.607(a)(4))**

Applicants' claims 23-26 correspond substantially to proposed Count 1.

As shown above, claims 23-26 of this application are copied from Onyia claim 9. All of the subject matter of Applicants' claims 23-26 is embraced by Onyia claim 9, which is identical to proposed Count 1. Thus, all of the subject matter of Applicants' claims 23-26 falls within proposed Count 1.

**F. Application Of The Terms Of  
The Claims To The Disclosure  
(37 C.F.R. § 1.607(a)(5))**

A claim chart applying the terms of Applicants' new claims 23-26 to the disclosure of the present application is attached to this Paper as Appendix A.

Appendix A demonstrates that Applicants' claims 23-26 are fully supported by the specification of the present application.

The present patent application is a continuation of, and claims priority to, Applicants' pending U.S. patent application Serial No. 09/973,529 ("the '529



application”), filed October 9, 2001. The ‘529 application is a continuation-in-part of, and claims priority to, abandoned U.S. patent application Serial No. 09/686,735 (“the ‘735 application”), filed October 10, 2000. The ‘735 application fully discloses the subject matter of Applicants’ claims 23-26. A claim chart applying the terms of Applicants’ new claims 23-26 to the disclosure of the ‘735 application is attached to this Paper as Appendix B.

**G. The Requirements Of  
35 U.S.C. § 135(b) Are Met  
(37 C.F.R. § 1.607(a)(6))**

The Onyia patent issued on October 29, 2002. Applicants’ Claims 23-26 are being added to this application as of the September 18, 2003, filing date of this Paper, which is less than one year after issue of the Onyia patent. Thus, the requirements of 35 U.S.C. § 135(b)(1) have been satisfied.

The Onyia patent issued from U.S. patent application Serial No. 09/805,422 (“the ‘422 application”), filed March 13, 2001. A Certificate of Correction for the Onyia patent states that no claim of priority is made to an earlier application. Onyia’s PCT application no. PCT/US02/06009, which claims the benefit of the ‘422 application, published on September 19, 2002, as International Publication No. WO 02/073240 A1. Applicants’ Claims 23-26 are being added to this application as of the September 18, 2003, filing date of this Paper and the accompanying Preliminary Amendment, which is less than one year after Onyia’s PCT publication date. Thus, the requirements of 35 U.S.C. § 135(b)(2) have been satisfied.

**A. Conclusion**

An early declaration of interference between the present application and the Onyia patent, with Applicants as the senior party, is earnestly requested.

Respectfully submitted,



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